

President - Texas Division
Southwestern Bell Telephone Company
Dallas, Texas
Issued:
Effective:

PRIVATE 4E SERVICE TARIFF
ction: 4
Sheet: 2
Revision: Original
Replacing:

LOCAL ACCESS AND TRANSPORT AREAS

2. List of Local Access and Transport Areas (Cont'd)

2.2 AMARILLO LATA (556) (Cont'd)

ASSOCIATED LOCAL EXCHANGE COMPANY EXCHANGES (Cont'd)

Mazareth	Spearsen	Turpin, Okla.
Oklahoma Lane	Stevens	Tyrone, Okla.
Panhandle	Stratford	Urbarger
Parmer	Summerfield	Vega
Perryton	Sunray	Wallington
Pleasant Hill	Tedhoma, Okla.	Wheatley
Quitaque	Texline	Wheeler
Sanford	Thorp	White Deer
Silverton	Turkey	Wilderado
South Tedhoma		

2.3 AUSTIN LATA (558)

ADAMSVILLE	LANPASAS	ROCKDALE
AUSTIN	LIBERTY HILL	SMITHVILLE
BASTROP	LOCKHART	TAYLOR
ELGIN		

ASSOCIATED LOCAL EXCHANGE COMPANY EXCHANGES

Bertram	Georgetown	MoDade
Briggs	Granger	Milano
Buchanan Dam	Hutto	Paige
Buda	Jarrel	Rocky Creek
Burnet	Kempner	San Gabriel
Coupland	Kyle	San Marcos
Dale	LoMeta	Thornedale-Threll
Dripping Springs	Lytton Spring	Wimberley
Fantress	Martindale	

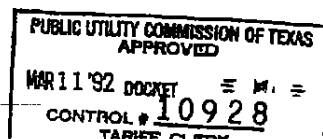
2.4 BEAUMONT LATA (562)

BEAUMONT	KOUNTZE	SOUR LAKE
BRIDGE CITY	LaBelle	SOUTH VIDOR
BUNA	LUMBERTON	SPURGER
CHINA	MAURICEVILLE	VIDOR
DEMMEVILLE	NEDERLAND-PORT NECHES	WARREN
EVANALE	ORANGE	WESTBURY
FARMETT	FORT ARTHUR	WILMWOOD
JASPER	SABINE PASS	WOODVILLE
KIRBYVILLE	SILSBEE	

ASSOCIATED LOCAL EXCHANGE COMPANY EXCHANGES

Amhuac	Fairmount	Horton
Bon Wier	Hawthire	Noss
Bronson	Herkamer	Pineland
Burkeville	Hempill	Smith Point
Colmesneil	High Island	Walleraville
Double Bayou	Milan	Winnie

EXHIBIT 4



CENTURYTEL

PAGE 6 - CTR
ACCOUNT NUMBER 512-393-
BILLING DATE 05/25/02

DATE	CALLED FROM	CALLED TO	TIME	TYPE	MIN	AMOUNT
01 05-01	AUSTIN	TX			1	.30
02 05-01	AUSTIN	TX			1	.30
03 05-03	AUSTIN	TX			1	.30
04 05-04	AUSTIN	TX			7	1.01
05 05-11	AUSTIN	TX			2	.29
THERIZED CHARGES FOR 512-393-					2.50	
06 05-09	LOCKHART	TX	512-384-	4:56PM	A	1 .10
THERIZED CHARGES FOR 512-383-					.10	
07 05-21	AUSTIN	TX		4:35PM	A	1 .20
08 05-21	AUSTIN	TX		4:36PM	A	1 .20
09 05-23	LOCKHART	TX	512-384-	12:31PM	A	1 .10
10 05-23	LOCKHART	TX	512-384-	12:32PM	A	1 .10
11 05-23	LOCKHART	TX	512-384-	12:33PM	A	1 .10
12 05-23	LOCKHART	TX	512-384-	12:33PM	A	1 .10
13 05-23	LOCKHART	TX	512-384-	12:34PM	A	1 .10
14 05-23	LOCKHART	TX	512-384-	12:34PM	A	1 .10
THERIZED CHARGES FOR 512-393-					1.00	
15 05-24	LOCKHART	TX	512-384-	10:10AM	A	1 .06
16 05-21	LOCKHART	TX	512-384-	1:43PM	A	1 .10
THERIZED CHARGES FOR 512-393-					.16	
17 04-30	LOCKHART	TX	512-384-	11:03AM	A	1 .10
18 05-07	LOCKHART	TX	512-384-	3:41PM	A	1 .10
THERIZED CHARGES FOR 512-393-					.20	
TOTAL OF THERIZED CALLS			28.0 MINUTES			3.96
FEDERAL TAX					7.27	
STATE TAX					16.36	
INDEAN UNIVERSAL SERVICE					9.10	
COUNTY SALES TAX					1.31	
CITY SALES TAX					3.93	
9-1-1 AND POLICE SURCHARGE					.02	
911 SERVICE SURCHARGE					5.50	
CITY FRANCHISE TAX					5.83	
TOTAL OF TAXES						49.32
TOTAL CenturyTel						293.66

TYPE:
A-DIRECT DIAL
V-THEIR NUMBER

B-CALLING CARD
NUMBERED 512-393-XXXX

C-COLLECT
NUMBERED 512-393-XXXX

CENTURYTEL

PAGE 4 - CTR
ACCOUNT NUMBER
BILLING DATE

0	2.05 MAY 08	2.05	
MINC CHRG/ADDS FOR 512-393-3409			9.15
EXPANDED LOCAL CALLING SERVICE		.39	
BRI SW DATA "B" CHRG-NOR		13.37	
TOTAL LOCAL EXCHANGE SERVICES			13.76
MONTHLY SERVICE AMOUNT FOR 512-393-			13.76
AND CHG OFF LINE CHARGE-BUS			
0	3.60 MAY 08	3.60	
AND LINE CHRG CHARGE-BUS			
0	3.50 MAY 08	3.50	
MINC CHRG/ADDS FOR 512-393-			7.19
EXPANDED LOCAL CALLING SERVICE		8.97	
FEDERAL UNIV SWY CHG PRT		1.85	
PRT ACCESS LINE		824.00	
TOTAL LOCAL EXCHANGE SERVICES			834.82
SURCHARGE LINE CHARGE - IPTR			46.00
TRON LINE PORT PRT		23.51	
TOTAL OPTIONAL FEATURES/SERVICES			23.51
MONTHLY SERVICE AMOUNT FOR 512-393-			904.33
TOTAL MONTHLY SERVICE AMOUNT			904.33
TOTAL MINC CHRG/ADDS			167.58

Long Distance Detail

LINE DATE	CALLED FROM	CALLED TO	TIME	TYPE	MIN	AMOUNT
01 05-07	LOCKHART	TX	512-384-	11:00AM	A	1 .10
02 05-07	LOCKHART	TX	512-384-	11:01AM	A	6 .30
03 05-07	LOCKHART	TX	512-384-	11:12AM	A	6 .30
04 05-07	LOCKHART	TX	512-384-	11:20AM	A	6 .30
05 05-07	LOCKHART	TX	512-384-	11:32AM	A	6 .30
THERIZED CHARGES FOR 512-393-						2.10
06 05-07	LOCKHART	TX	512-384-	10:47AM	A	1 .10
07 05-07	LOCKHART	TX	512-384-	10:48AM	A	1 .10
08 05-07	LOCKHART	TX	512-384-	10:50AM	A	1 .10
THERIZED CHARGES FOR 512-393-						.30
TOTAL OF THERIZED CALLS						28.0 MINUTES
						2.40
9-1-1 AND POLICE SURCHARGE						.01
911 SERVICE SURCHARGE						1.00
CITY FRANCHISE TAX						1.06

TYPE:
A-DIRECT DIAL

B-CALLING CARD
NUMBERED 512-393-XXXX

C-COLLECT
NUMBERED 512-393-XXXX

SOAH DOCKET NO. 473-02-2503
PUC DOCKET NO. 25673

JUL 13 03 28
COMPLAINT, REQUEST FOR
EXPEDITED RULING, REQUEST
FOR INTERIM RULING, AND
REQUEST FOR EMERGENCY
ACTION OF ASAP PAGING, INC.
AGAINST CENTURYTEL OF
SAN MARCOS, INC.

62 JUL 13 P. 3:05
BEFORE THE
PUBLIC UTILITY COMMISSION
OF TEXAS

DIRECT TESTIMONY OF FRED GOLDSTEIN

Q: Please state your name, occupation and job responsibilities.

A: My name is Fred Goldstein. I am a Senior Consultant in the Communications, Information Technology and Electronics practice of TIAX LLC, formerly the Technology and Innovation line of business of Arthur D. Little Inc. I advise companies on technical, regulatory and business issues related to the telecommunications and Internet industries, especially in areas where the two overlap.

Q: What is your education and training background?

A: I hold a Bachelor of Arts degree from Skidmore College. I am also a Senior Member of the IEEE. I hold three patents in the area of Asynchronous Transfer Mode technology, including two for methods of congestion control and avoidance, and one for a LAN-oriented ATM switching system. I have been a member of the faculty of the State-of-the-Art Program at Northeastern University, and have taught courses on ISDN, Frame Relay, ATM, telecommunications transmission, and OSI and TCP/IP protocols. I also have taught several satellite courses on ATM, Frame Relay and ISDN for National Technological University.

Q: What is the purpose of your testimony?

A: ASAP Paging, Inc. ("ASAP") has requested me to provide testimony on some of the technical and regulatory issues involved in this case.

Q: Was CenturyTel following industry practice when it attempted to route ASAP's Lockhart calls to the Southwestern Bell Lockhart switch, LCKHTXLKDS1?

A: No. The Southwestern Bell Lockhart switch is an end office. It should only provide dial tone to its own subscribers. ASAP is a different carrier, not a subscriber to Southwestern Bell.

Q: Are there other end offices with Lockhart numbers?

A: Yes, there are. The Southwestern Bell switch is not the only one with Lockhart numbers, and because it is an end office, it cannot connect other terminating carriers' calls, such as ASAP's, to the proper switch. Besides ASAP Paging's 512-384 prefix, Dobson Cellular's 512-995 prefix, AT&T's 512-855 prefix and Tex-Link Communications' 512-729 prefix are assigned to Lockhart. According to the North American Numbering Plan Administration (NANPA) database, Dobson's prefix is served from its Bastrop site, while ASAP, AT&T and Tex-Link are served through switches in Austin.

Q: How does an end office differ, functionally, from a tandem office?

A: A tandem office performs trunk to trunk switching. That is, it has the ability to take calls that arrive on intermachine trunks (also called IMTs) from one switching office and route them to another switching office. It is thus the midpoint of a call between two other offices.

An end office, in contrast, lacks this capability. Trunks to an end office are only for the benefit of subscriber lines which terminate within that end office; connections are not normally made between IMTs. An end office always has trunks to at least one tandem office. It may also have Direct End Office Trunks (DEOTs) to other end offices, for calls that go directly between subscribers served by those two end offices. However, such DEOTs are normally only installed when traffic levels warrant it. Local calls may thus go through the tandem if conditions so warrant, and, if traffic warrants, toll calls may go directly between end offices.

The point is that a carrier does not send traffic to an end office switch if the call is destined to another carrier's switch. CenturyTel improperly tried to use SWBT's Lockhart end office as a tandem.

Q: Has this always been standard practice in the telephone industry?

A: No. Before the 1980s, outside of metropolitan areas, "local" calls were almost always directly routed between end offices. Indeed, in order to add extended local calling, telephone companies typically needed to construct physical trunk facilities directly between the two offices. There were also toll offices, which carried only toll traffic, and which frequently performed the data collection needed for toll call billing. Tandem switches were used for local calls in some larger metropolitan areas. But in rural areas, where direct control switches prevailed, dialing "1" typically seized a trunk to a toll switch, and the call would be billed as toll. So there were separate "local" and "toll" trunks leaving an end office, typically with different destinations.

1 Q. How did this change during the 1980s?

2 A. A number of changes were effected during the 1980s. For example, as a result of the
3 AT&T divestiture and the establishment of LATAs and Equal Access, a system of Access
4 Tandems was created. These provided interchange carriers with a small set of interconnection
5 points in each LATA. The five-level hierarchy of switches previously used for Direct Distance
6 Dialing (Regional, Sectional, Primary, Toll and Local, hence the term "Class 5" for end offices)
7 was also discontinued. The local exchange carriers' LATA networks became a two-level
8 hierarchy (end office and tandem) with every end office hooked on a tandem.

9 As this was happening, digital switches were replacing analog ones. Many smaller end
10 offices were also replaced by remote switching modules attached to larger digital Host switches.
11 As a general rule, remote modules do not need DMTs; they only have trunks to the host or, in
12 some cases, other remotes of the same host. This has further simplified the network. But it has
13 also led to a wider difference between tariff concepts of "local" and the physical network
14 topology. A small end office that is replaced by a remote usually keeps its rate center
15 designation, and its local calling area. Calls within the same host-remote cluster may be toll,
16 while ELCS calls are routed via the host.

17 With the universal adoption of stored program control, as the last electromechanical
18 switches were phased out, all switches gained sufficient capability to be able to route calls based
19 upon a table lookup of the area code - prefix ("NPA/NXX") code combination. This allowed a
20 "first and final" routing system to be adopted for local calls, wherein a first-choice DBOOT trunk
21 group, for instance, could be used if available, with overflow calls going by way of a tandem.
22 Before that, many switches, particularly step-by-step and similar direct control switches, literally
23 routed calls on a digit by digit basis, a rather less flexible arrangement.

24 Q. What changes occurred as a result of the Telecom Act?

25 A. The Telecom Act introduced local competition to all states. It essentially created a peer
26 relationship between local carriers, which allows multiple carriers in each rate center. So there
27 can no longer be an expectation that a given rate center is served by only one carrier. In general,
28 the ILBC still determines the tandem homing relationship for a given rate center. Carriers who
29 serve that rate center need to be reachable via the same tandems as the ILBC. The exact details
30 of interconnection are typically negotiated, arbitrated, or set by regulators within Federal
31 guidelines.

4 Q. Does any given tandem always carry both local and toll traffic?

5 A. Usually, but not always. As tandem switches congest due to traffic growth, ILBCs have
6 multiple relief options. One method is to divide the tandem-served area, with some switches
7 being rerouted onto a new tandem. Another method is to move Switched Access traffic onto a
8 separate Access tandem from that used for intra-LATA traffic. It is even possible to separate
9 originating from terminating Access traffic. Intra-LATA toll traffic would generally, in such
10 cases, remain with local traffic. Such decisions are always published well in advance by the
11 ILEC who operates the tandem, and are reflected in the LRIC.

12 Q. Does a carrier switch always have direct trunks to the ILBC end offices in the rate centers
13 it serves?

14 A. No. Carrier switches always have connections to at least one tandem. They may also
15 have direct end office trunks. That is usually based on a traffic engineering standard. This
16 standard may be set forth in an interconnect agreement, or set at a state level, and typically varies
17 from state to state. If traffic between the CLBC and a given ILBC end office is below some de
18 terminis level, then all traffic to that end office may be routed via the tandem. DBOOTs are
19 generally installed when traffic exceeds that threshold. If DBOOTs are installed but congested,
20 traffic can still overflow via the tandem; that is what first-and-final routing does.

21 Q. Do CMRS carriers operate the same way as CLBCs?

22 A. Not exactly. CMRS carriers are governed by separate federal rules, not CLBC
23 interconnect agreements. It is my understanding that a CMRS carrier can request tandem-only
24 interconnection, without the requirement to install DBOOTs even when traffic levels are relatively
25 large. The CMRS carrier connects to the tandem that serves the rate center to which the NXX is
26 associated. Here, ASAP is connected to SWBT's Greenwood tandem, because that tandem
27 serves the NXXs in issue, including the Lockheed rate center. This is why all the carriers -
28 ASAP, AT&T and Dobson connect there. Similarly, Ter-Link, which is a CLBC, also connects
29 to SWBT's Greenwood tandem to receive calls dialed to its Lockheed NXX.

30 Q. Then what is the remaining relationship between the local/toll billing dichotomy and the
31 way calls are routed?

32 A. Technically, none. Billing is based on tariff, while routing is typically an engineering
33 decision. The "toll office" of yore no longer exists; tandem coverage is universal and is available
34 for local calls.

Q. Are trunking arrangements always reflected in the way transmission plant is installed?

A. No. Interoffice transmission plant design is based on yet another set of decisions. Because of the low incremental cost of fiber optic bandwidth, bandwidth may be most economically derived from relatively indirect routes. Common industry practice nowadays is to install SONET rings among groups of offices. Thus a trunk facility will be derived from bandwidth that may traverse one ring, or multiple rings, as needed.

Q. What is meant by "Type 1" wireless interconnection?

A. Type 1 wireless interconnection between a CMRS carrier and an ILEC is made to an ILEC end office, as if the wireless carrier were a subscriber of the serving ILEC's retail service. There has been some ambiguity over time around the use of the terms "Type 1" and "Type 2" connections. The Ordering and Billing Forum has, however, adopted a set of definitions for the industry to standardize on¹.

Wireless Type 1 interconnection

Type 1 interconnection offers a trunk-side connection from an End Office (EO) to a Wireless Services Provider (WSP). This trunk-side connection has a Trunk With Line Treatment (TWLT) feature, or its equivalent, that offers trunk-side signaling and supervision but treats the connection as a line for recording purposes. With a Type 1 interconnection, the WSP can establish connections to valid NXX codes in the LATA.

This replaces the older "Type 1" that referred to a line-side connection, which is technically obsolete. A Direct Inward Dialing trunk to a PBX is similar to this. The number block is that of the serving carrier's switch, not that of the CMRS carrier. Thus a CMRS company would not use Type 1 signaling with its own prefix codes.

Q. What is meant by "Type 2" wireless interconnection?

A. Type 2 interconnection is more of a peer interconnection between carriers, using trunk connections. The Ordering and Billing Forum specifies two subsets of Type 2 interconnection:

Wireless Type 2A interconnection

Type 2A interconnection is a trunk-side connection to the access or local tandem. The WSP functions like an EO. The tandem homing arrangements are specified in the Local Exchange Routing Guide (LERG)

Wireless Type 2B interconnection

¹ Ordering and Billing Forum, Issue Number 1782, November 19, 1999

Type 2B interconnection is a trunk-side connection to an EO and functions exactly like a high usage trunk. It is intended to be used with a Type 2A connection in situations where the WSP has large traffic quantities to and from NXX codes within a specific EO. The first choice route is the Type 2B connection with overflow allowed via the Type 2A connection. With the Type 2B connection, the WSP can establish connections only to valid NXX codes in the EO providing the Type 2B connection.

Type 2A is precisely the type of connection that ASAP uses. Each of ASAP's prefix codes is listed in the LERG. Homing is defined in the LERG. The OBF definition recognizes that either an access or local tandem can be used. SWBT's Greenwood tandem is a combined local/access tandem. It connects various end offices for local, intraLATA and interLATA traffic. Other ILECs, CLECs, CMRS carriers and IXCs all interconnect there to obtain connectivity to the end offices it serves.

Type 2B is used to supplement Type 2A when traffic from a given end office is high enough to warrant a high usage trunk. Calls sent on a Type 2B link cannot be extended to a third switch, because it is an End Office, not tandem, connection. It is important to note that a Type 2B connection coexists "with a type 2A connection", not in lieu of one. A high usage trunk is *not* engineered for the desired grade of service, because overflow traffic flows to the "final" route, which is the Type 2A connection. Thus the Type 2A connection must correctly handle the prefix codes; a Type 2B connection only exists to optimize network cost or bypass tandem congestion.

Q. ASAP Paging's Lockhart rate center is served out of a switch in Austin. Why isn't the competitive carrier's switch usually located within the same exchange area as its rate center, like the ILECs'?

A. First off, ILECs do not always put their switches within the rate center's own service area. Small rate centers are served by remote switching units, or even in some cases just line concentrators or multiplexors, which do not have trunk interfaces.

CMRS providers do not use the loop at all, and therefore have a single switch to serve a regional radio network. Radio waves do not respect wireline rate centers and exchange area boundaries.

Q. Shouldn't CLECs put switches in the same places as the ILECs?

A. CLECs, being smaller than ILECs, are unlikely to have enough subscribers in most end offices to warrant a dedicated switch. CLECs are also subject to restrictions that force them to use a different network architecture from ILECs. A CLEC needs to collocate equipment in order

to gain access to the local loop, but collocation is generally limited to equipment needed to access the loop. The FCC and court interpretations of the Telecom Act that were in effect for the first few years after the passage of the Act did not allow any "switches" to be put into a collocation node; even remote switch modules were controversial, because, some ILECs insisted, lower-functioning multiplexors *could* be used instead. More recent interpretations allow CLECs to install switches *if* the switch takes up no more floor space than a multiplexor would; this rules out traditional switches, but does not ban switching functions from modern multifunctional equipment.

So for a wireline CLEC, the traditional function of "switch" is really disaggregated into two functions. One, referred to in ITU-T standards as the "Exchange Terminator" (ET), includes common control, trunk interfaces, and most switching functions. The other, the "Line Terminator" (LT), includes line interface and multiplexing functions, and sometimes limited switching of calls within the LT. The ET and LT *must*, in general, go into separate places; the LT goes at the ILEC collocation node while the ET is centralized for a metropolitan area, at the CLEC's own premise or at another non-ILEC "carrier hotel".

So for example, if a CLEC had Lockhart numbers, and served local loops in Lockhart, it would need to put an LT into Southwestern Bell's Lockhart wire center. But the trunks would be delivered to the ET, which could, for instance, be in Austin, closer to the tandem.

Q. How is this different than how a CMRS carrier interconnects?

A. Again, CMRS carriers do not usually serve access lines to customers. They typically only interconnect with LECs under §§ 152, 201, 251 and 332(c)(1)(B) of the federal Act. They rarely need UNEs or collocation (although they can obtain them if they wish). They have no need to have a physical presence in every local calling area. It is more efficient for all concerned if they interconnect at a tandem and then derive DEOTs (Type 2B) to high volume end offices.

Q. What should happen if a carrier were to deliver a call to the ILEC's switch in a given rate center, rather than to the actual serving carrier's switch?

A. The ILEC switch should reject the call, because it was clearly misrouted. Likewise, the CMRS carrier or CLEC should reject calls dialed to ILEC numbers, unless their switches happen to also be designated as tandems, in which case the CMRS carrier or CLEC should route to the ILEC according to the instructions in the LERG.

Q. A CMRS carrier does not necessarily have an interconnect agreement. How then does the ILEC know how to route calls to it?

A. The Local Exchange Routing Guide (LERG) should be definitive. For every prefix code, the LERG lists the carrier, and provides the location of the serving switch, as well as rate center assignments and tandem homing arrangements. Various additional technical information is also included to help insure that calls are properly completed.

Q. How do rating point and routing point differ?

A. Rating point is a billing construct; it is essentially the same as the Rate Center applied to a given call. Here is a standard definition taken from an interconnect agreement:³

1.49. "Rating Point" means the vertical and horizontal ("V&H") coordinates assigned to a Rate Center and associated with a particular telephone number for rating purposes. The Rating Point must be in the same LATA as the Routing Point of the associated NPA-NXX as designated in the LERG, but need not be in the same location as that Routing Point.

Routing is basically an engineering parameter. It determines how calls get from one phone to another. From the same interconnect agreement:

1.50. "Routing Point" means the V&H coordinates that a Telecommunications Carrier has designated as the destination for traffic inbound to services provided by that Telecommunications Carrier that bear a certain NPA-NXX designation. The Routing Point need not be the same as the Rating Point, but it must be in the same LATA as the Rating Point. Central Office Switches are Routing Points for traffic to and from users identified by numbers drawn from NPA-NXX designations, as stated in the LERG. Where Carrier has not established Routing Points for its Dedicated NPA-NXXs in its own network, the Routing Point shall be the Telco Tandem Switch where traffic to Telco NXXs in the same NPA is homed.

Note that both definitions affirm that they need not refer to the same point as the other; the rating point need not be the routing point, and vice-versa. They need merely be in the same LATA. Also it is important to note in the above definition that the default routing point for the non-ILEC Carrier is specified as the ILEC tandem switch.

³ CELLULAR/PCS INTERCONNECTION AGREEMENT by and between Dobson Cellular Systems, Inc. and Southwestern Bell Telephone Company, Illinois Bell Telephone Company, d.b.a. Ameritech Illinois; Michigan Bell Telephone Company, d.b.a. Ameritech Michigan; Wisconsin Bell, Inc., d.b.a. Ameritech Wisconsin; and the Ohio Bell Telephone Company, d.b.a. Ameritech Ohio. December, 2000

As I noted before, competitive carriers do not put switches in every rate center. Thus there are generally many more rating points than routing points within a competitive carrier's network. ILECs hand off traffic on the basis of these routing points. Sending the call to another carrier's switch whose routing point happens to be the same as the desired number's rating point is, I dare say, pointless. Yet this appears to be exactly what CenturyTel was doing when it attempted to send ASAP's Lockhart numbers to SWBT's Lockhart switch! SWBT's Lockhart switch presumably may have a routing point in Lockhart, but that is irrelevant to ASAP's numbers, because they are not served by Type 1 interconnection to SWBT's Lockhart switch. They have their own routing point, in Austin.

Q. What is local dialing parity, and why is it so important?

A. Local dialing parity means that calls made to every carrier's numbers assigned to a given rate center should be dialed identically. Thus in this example, if a CenturyTel subscriber in San Marcos can dial an SWBT number in Lockhart by dialing seven digits, then local dialing parity would require seven-digit dialing to ASAP and any other carrier's Lockhart numbers. The definition of a number as being in any given rate center, such as Lockhart, should be according to the LERG. The FCC enshrines this in their Regulations:

Sec. 51.207 Local dialing parity

A ILEC shall permit telephone exchange service customers within a local calling area to dial the same number of digits to make a local telephone call notwithstanding the identity of the customer's or the called party's telecommunications service provider.

The FCC expressly included CMRS carriers in the class of carriers entitled to local dialing parity when it adopted this regulation. CenturyTel therefore must allow its users to dial 7 digits to get to ASAP's Lockhart NXX, since Lockhart is in the same local calling area as San Marcos.

Q. Should a carrier be able to "pick and choose" which other carriers' numbers are within its ELCS area?

A. No; carriers should not be allowed to discriminate among other carriers in setting up local calling areas. Again, the LERG assignments of rate centers should be definitive. Subscribers, for instance, need to know which calls are local and which are not. If an ILEC charges tolls to call a CLEC or CMRS number in a rate center that is local for ILEC-ILEC calls, then the CLEC or CMRS provider will have a harder time signing up subscribers, and the ILEC's subscribers

will find themselves with unexpected toll charges if they call "local" numbers served by other carriers.

This is not to say that every carrier's local calling area needs to be the same. Local calling area is an originating line's characteristic. There are instances of cities with multiple optional calling plans. This is not as pronounced in Texas as in some other places. For example, in the Boston area, Verizon, the ILEC, offers at least six residential "local" calling plans, which often differ in what constitutes a "local" call. Costlier plans, such as "metropolitan" and "circle", have a wider local calling area than lower-priced plans such as "contiguous". And other carriers' local calling plans do not necessarily match any of Verizon's. But all carriers normally respect each others' rate center assignments.

So, for example, if a Verizon "contiguous" subscriber in Brookline calls a CLEC's number which is assigned to the Jamaica Plain rate center, then it is local, because Jamaica Plain is in Brookline's contiguous area, even though the CLEC's switch is almost certainly not within the Jamaica Plain exchange area. Indeed, the switch that Verizon uses to serve Jamaica Plain itself is not within the Jamaica Plain exchange area. Jamaica Plain is served by Verizon's Roxbury switch, mostly over long feeder cables. Verizon has divided its several of its rate centers even more finely than it has divided its physical (wire center serving area) network. Rate centers are, after all, a retail pricing artifact, not an engineering definition.

Q. Do you have any concluding remarks?

A. Yes. CenturyTel should follow the industry practice and route calls to ASAP's NXXs according to the LERG. It should not have attempted to send calls to ASAP's Lockhart NXX to SWBT's end office. Competitive carriers quite often do not have equipment or even a physical presence in an area where they provide service, and ASAP has followed accepted practices in setting up its network. CenturyTel's attempt to require 1+ dialing and impose toll on its users who dial ASAP's NXXs violate public policy and is anticompetitive.

Q. Does this conclude your direct testimony?

A. For now. ASAP has some discovery questions that are still outstanding. If CenturyTel provides answers I may supplement this Direct. Thank you for the opportunity to present this testimony.

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BEFORE THE CLERK

COMPLAINT, REQUEST FOR
EXPEDITED RULING, REQUEST
FOR INTERIM RULING, AND
REQUEST FOR EMERGENCY ACTION
OF ASAP, INC.
AGAINST CENTURYTEL OF
SAN MARCOS, INC.

PUBLIC UTILITY COMMISSION
OF TEXAS

PRE-FILED REBUTTAL TESTIMONY OF FRED GOLDSTEIN

Q: Please state your name.

A: Fred Goldstein.

Q: Are you the same Fred Goldstein who submitted Direct Testimony on behalf of ASAP?

A: Yes.

Q: Please state the purpose of this testimony.

A: I am rebutting the testimony of CenturyTel of San Marcos witnesses Wesley Robinson, John Navarrette, and Susan Smith in PUC Docket 25673 concerning the ability of ASAP Paging to receive local calls from San Marcos subscribers. I also rebut Staff witness Kelsaw's testimony on ELCS.

Q: Does ASAP Paging resell or lease its paging numbers to Internet Service Providers?

A: No. ASAP Paging assigns directory numbers to ISPs, just as it assigns numbers to pagers, and other carriers assign numbers to their subscribers. The actual quantity of telephone numbers used for ISPs is small, compared to the quantity of pager numbers. Thus the impact of ISPs on the numbering plan is minimal by any measure. Assigning numbers to ISPs using vacant numbers in a CMRS "paging" NXX block - which is not portable or subject to thousands-block pooling - is an excellent and efficient use of numbers. ISPs only need one number in an NXX block. They need a number anyway, so why not use a resource that would otherwise lie fallow?

Q: Then does ASAP have a need for all of its NXX codes?

A: ASAP has two options for providing pager customers with non-toll numbers. One is to use its reverse-billed prefix, in which case it bears a usage charge. This service is provided by SBC and CenturyTel, but could be withdrawn in the future, which would leave paging customers without local service. The other option is to use NXX codes assigned to areas where its paging

1 subscribers might be located; for example, it has paging coverage in areas local to Lockhart,
2 Kyle and Pears. This way, a paging subscriber would select the local calling area it needs.

3 CenturyTel witness Robinson erroneously states (at 8), "It appears that ASAP has not
4 established a physical presence or interoffice trunking in the geographic areas where these NPA-
5 NXXs are 'designated'..." ASAP, a wireless carrier, has paging transmitters which service those
6 areas. Even CenturyTel witness Navarrette concedes the same (Navarrette at 7) when he states,
7 "I understand that ASAP has a transmitter in the San Marcos exchange." The value of a paging
8 company's service, of course, is increased when its radio coverage area increases. As ASAP has
9 added transmitters, it has made its service more attractive to potential local subscribers in these
10 areas.

11 Q: Is the Maine situation analogous?

12 A: No. Robinson (at 9) alludes to the Maine PUC's rejection of Brooks Fiber's Virtual NXX
13 service. However, there is no valid analogy here. First, the Maine decision was an outlier; most
14 states, including Texas, have allowed VNXX service. Second, Brooks was acting as a state-
15 certificated CLBC, not as an FCC-licensed CMRS provider. Third, Brooks audaciously refused
16 to have any physical presence in Maine outside of the Portland local calling area, unlike ASAP
17 which has paging coverage over a much broader area, which means that its NXX codes are not
18 even "virtual". Fourth, Brooks' state certification was limited to the Portland area; unlike some
19 states, Maine requires that CLBCs state in advance what exchanges they will be serving. Brooks
20 received NXX codes in areas it had not obtained permission to serve. Thus Brooks had a
21 relatively weak case. It is simply not a valid analogue to ASAP. I also note that several states
22 such as Texas, Illinois and Michigan have either expressly disagreed with Maine or very much
23 limited the effect of the Maine decision.

24 Q: Does Robinson correctly characterize the service that ASAP provides to ISPs?

25 A: No. He opines (at 23) that "the only 'service' ASAP provides to ISPs is the resale of its
26 CMRS numbers and the resale of its interconnection trunks." Both numbers and trunks are
27 essential elements of telecommunications service. They are necessary, but not sufficient. ASAP
28 adds value and other things to the transaction. It is not reselling numbers per se; rather, it is
29 providing a service using those input elements, and adds additional services or functions,
30 including switching and the connection to the ISP. Simply put, ASAP adds outputs and value

1 beyond the ILBC-supplied inputs. Using Mr. Robinson's method of characterization, a rancher
2 hauling his cattle to market is merely reselling into feed grain.

3 ASAP's offering of collocation to its ISP customers is not a "sham transaction". Rather,
4 it is a valuable service that allows ISPs to save on the cost of local loop facilities between the
5 switching system and their modem banks. Many CLBCs offer a similar service, which is one
6 reason why they are more attractive to ISPs than ILBCs.

7 Q. Is ASAP providing an "8YY" service as Robinson and Smith claim?

8 A. Not at all. ASAP does permit its ISP subscribers to have foreign-exchange numbers, to
9 the limited extent that the modems are not physically located in the served rate center. This to
10 some extent resembles Virtual NXX, a fairly popular method for providing rural subscribers with
11 Internet connectivity, or to traditional foreign exchange service. But it bears no real similarity to
12 "8YY" reversed-charge service. For one thing, an 8YY service would use a single number
13 throughout a company's service territory, which could be nationwide. It would make use of a
14 database dip for number portability, compared to ASAP's CMRS prefix codes which are not
15 portable. In areas that have measured local service, FX and VNXX both have local usage
16 charges, while 8YY is free to the caller. These are just some of the differences. The Texas
17 Commission has already rejected the comparison of FX-like to 8YY, as has Illinois.

18 Q. Is ASAP providing a service that is "identical to the service offerings of IXCs, and
19 subject to access charges", as Robinson states (at 23)?

20 A. Not at all. The service offered by an IXC is precisely the opposite of that offered by
21 ASAP. An IXC offers a transit service that accesses the entire worldwide telephone network as
22 its open end; ASAP is offering a terminating service that accesses its own subscribers. An IXC
23 carries calls in both directions; ASAP does not originate calls, either for its paging or ISP
24 customers. An IXC does not issue directory numbers to its subscribers; ASAP does. An IXC
25 receives the originating leg of calls from any exchange in the regions it serves, without regard to
26 local calling radius; ASAP's numbers, other than the special 512-222 prefix, are meant to be
27 accessible without toll charges only from their designated local calling areas.

28 CenturyTel is essentially taking one narrow aspect of ASAP's service and using that
29 aspect to analogize the service to something totally different. The narrow aspect is that ASAP's
30 service allows some calls to be made, from some areas, to terminating numbers that may
31 physically be outside of the local calling area. Specifically, the modem banks for San Marcos

1 Internet and other ISPs can be collocated at ASAP's Austin location, without incurring the toll
2 charges needed to call most Austin numbers. Of course there are no toll charges incurred in
3 calling ordinary voice Foreign Exchange numbers whose open end is in a local rate center. FX is
4 probably the closest analogy to ASAP's service, not toll and this is what Texas and Illinois have
5 both found.

6 Q. Where do calls to San Marcos Internet made via ASAP actually go?

7 A. The FCC has held that ISP-bound calls do not actually "terminate", in the usual sense, at
8 the modem bank. Rather, they terminate all over the world, on the global Internet, and are thus
9 subject to interstate jurisdiction. However, they are not treated as "exchange access" calls;
10 rather, they are for the time being in a special class of "information access" calls which are
11 specifically exempted from switched access charges. This FCC ruling essentially moots the
12 location of the modem bank as a consideration factor in the rating of a call "to the Internet." The
13 important factor is the two NXXs. The ISP customers of ASAP that actually receive most of the
14 San Marcos-originated calls, such as San Marcos Internet, are actually based in San Marcos, and
15 have their own servers there. The Internet backbone providers are in Austin, which makes it a
16 logical place to put the modems, though the modem location is primarily determined by
17 proximity to ASAP's switch. When a San Marcos user calls San Marcos Internet and uploads
18 his mail, he is actually communicating with a computer in his local calling area. If San Marcos
19 Internet had to put its modems in San Marcos proper, or in the San Marcos local calling area,
20 then its transmission costs would be higher. CenturyTel's costs, however, would be no different.

21 Q. How much intrastate Switched Access revenue is CenturyTel losing when ISP-bound
22 calls terminate on an ASAP subscriber whose modem is in Austin?

23 A. None. The plain fact of the matter is that there is no market for Internet Service Provider
24 access over intrastate toll. ISP access is almost always provided on a local basis, due to the ISP
25 Exemption. In those cases when a subscriber cannot access an ISP locally, or cannot access
26 locally an ISP to which he is a subscriber, then the only alternative is interstate 800 service.
27 Interstate service is used for two reasons. One is that the switched access rate, and thus the retail
28 toll and 800 rate, is generally lower on interstate than intrastate toll. The second reason is that
29 ISP modems provide access to the worldwide Internet, so a centralized nationwide 8YY-
30 numbered modem pool is functionally adequate, for calls that cannot be dialed locally. But 8YY

1 is not the same as FX, it is an expensive alternative that is used only when nothing else will
2 work.

3 Most intrastate switched access revenues attributable to ISP-bound calls are probably for
4 *minutes* tolls. That is, when a subscriber dials a phone number that he *thinks* is local, but is not,
5 then tolls are incurred. This is typically corrected upon the arrival of the first bill.

6 Thus if ISPs could not use a centralized modem pool behind a switch such as ASAP's,
7 then the ISPs would simply not serve the same local areas. An ISP might lease LERC PRI's in its
8 own home community, but not provide service to surrounding areas. Residents of small local
9 calling areas would thus lose access to most of the ISPs that they can now choose. In some cases
10 they might have only toll/800 (*minutes*) access, while in others the LERC would have a local-
11 call monopoly with its "captive" service. I note that CenturyTel does offer a captive Internet
12 service in San Marcos; ASAP's service makes it easier for other ISPs to compete with it.
13 Certainly given the choice of making an intrastate long-distance call or using CenturyTel's local
14 ISP service, the bulk of San Marcos users would opt for the latter.

15 Q. What is a "CMRS Rate Center"?

16 A. Robinson states (at 25) "no ELCS petition has sought calling to a CMRS rate center." To
17 the best of my experience, which consists of approximately 25 years working with the
18 telecommunications industry, there is no such thing as a "CMRS Rate Center." Rate centers are
19 defined in state tariffs and identified nationally in the Local Exchange Routing Guide. LERNG
20 Table 8 identifies rate centers; it lists over 20,000 in the United States and Canada. Over a
21 thousand are in Texas. One of them is Lockhart. When a CMRS provider, or a LERC for that
22 matter, receives an NPA-NXX code, it assigns that code to a rate center. Nothing in LERNG 8
23 distinguishes between wireline and wireless rate centers. It is far more logical to consider all
24 carrier assignments to a given rate center as being subject to equal ELCS treatment. Were this not
25 the case, then new competitors entering a market would not have equivalent service to
26 incumbents. Even though only one exchange petitions for ELCS to the second one, both
27 exchanges benefit. This must be without regard to the identity of the terminating carrier if there
28 is to be any competition.

29 Q. Is ASAP's use of NXX codes in violation of ATIS Central Office Code Assignment
30 Guidelines, as Robinson implies (at 32)?

1 A. No, Mr. Robinson's accusations are delusional. He cites two different portions of the
2 Guidelines, either of which is sufficient to justify assignment of a code, and then implies that the
3 carrier needs to meet both of these at the same time. In layo terms, he is inferring an "and"
4 when an "or" will do. And even then, he is taking sentences out of context.

5 Section 2.13 of the Guidelines, cited by Robinson, includes the words "to provide service
6 to customer's premises physically located in the same rate center that the CO Codebooks are
7 assigned." But he conveniently omits the next sentence: "Except where noted, for example, toll-free
8 services such as with the exception of foreign exchange service." While I can't judge the
9 wordsmanship grammar skills of the Guidelines' authors, it is clear that they acknowledge that
10 FX and FX-type services exist which create exceptions to the rule that Robinson cites. And
11 by using the words "for example," they acknowledge that toll-free FX services are not the sole
12 exception; ASAP's non-toll-free FX-like services seem to fit clearly within the spirit of this
13 exception. In any event, he also omits the last part of the first sentence, which recognizes that
14 this guideline does not apply to wireless. Even if ASAP had no ISP customers, it would still
15 need these prefix codes for wireless use, which should render moot the question of code
16 assignment.

17 Robinson also implies that ASAP is even violating Section 4.1 of the Guidelines when
18 they provide wireless services to customers who carry a pager. He states (at 33) that "TIn regard
19 to the Kyja, Fentress and Lockhart rate centers, ASAP has not established any switching entities
20 or POIs in these rate centers and therefore violated existing industry guidelines when it applied
21 for NPA-NXX codes with these rate center designations for even its wireless service customers."
22 With regard to pagers, even the "FX-like" exception is not necessary: ASAP has physical paging
23 coverage, and can service local customers, in areas that are local to the Kyja, Fentress and
24 Lockhart rate centers. CMRS networks do not require POIs in every local calling area or rate
25 center, as made clear from the TSC decision, nor would it be practical to put a switch or POI in
26 each such area. Mr. Robinson is essentially implying that wireless networks should mimic the
27 wireline networks of the 1950s, before remote switch models or long carrier, when separate
28 little switches dotted the landscape and open-wire trunk lines criss-crossed the landscape. This is
29 not even technically feasible or, if it were, in any way sensible. FCC regulations recognize this
30 and allow a centralized POI for CMRS networks with various NXXs associated with those rate
31 centers where local calling is most needed leading to the POI.

Robinson repeats this assertion in his response 2.8 to ASAP's second RFI. He states, "As detailed in Section 3.1 of the Central Office Code Assignment Guidelines, ASAP must have a 'Switching Entity' or 'Point of Interconnection' that it owns or controls within the Lockhart rate center to obtain a Central Office Code rate centered in Lockhart, not a 'live' customer." This is not correct, although as noted below the Guidelines are not the final answer. All this sentence means is that an NXX must be associated with a switching entity or POI so that other carriers will know how to direct calls to it. Section 3.1 does not either expressly or implicitly require that there be a POI or switch within the geographic area comprising the rate center. There are two reasons. First, the Guidelines themselves recognize that the rate center point, the POI and the switch can each have different coordinates. Second, Mr. Robinson's opinion is simply inconsistent with the way the industry has operated for several years. Disparate rating and routing points are the norm for competitive providers. And these alternative providers are not scofflaws as a result of this practice. Mr. Robinson is trying to use the Guidelines to overrule the FCC's express holdings that carriers can have a single point of interconnection in a LATA, and CMRS carriers have the right to choose Type 2A (tandem) interconnection and associate NXXs with rate centers throughout the tandem served area in order to permit "local" calling to their customers. Mr. Gaudette discusses the FCC holdings in his testimony.

Section 4.1.1 of the Guidelines states, "[t]he applicant must submit an NXX request form certifying that a need exists for an NXX assignment to a point of interconnection or a switching entity due to rating, billing, regulatory, or tariff requirements". [Emphasis added.] In this case, the NXX meets billing, regulatory and tariff requirements, which collectively summarize the concept of "rating" a call, in contrast to "routing" a call to a POI. CMRS providers routinely have multiple rate centers on a single POI. The Guidelines state, in Section 6.2.2, "Each switching center, each rate center, and each POI may have unique V&H coordinates." This makes clear that rating and routing are separable.

The Florida Public Service Commission was recently asked by BellSouth to issue a Declaratory Statement to prohibit CMRS providers from assigning an NPA-NXX code to a rate center (rating point) that was different from its routing point, "because it would result in

BellSouth providing virtual designated exchange service outside of BellSouth's exchange territory". The Florida Commission refused this request, noting:

In its Petition for Declaratory Statement, BellSouth has asked an apparently simple question - whether loading Sprint PCS' NXXs will violate BellSouth's General Subscriber Services tariff - but the question belies the real complexity of the issues surrounding it, and a simple answer to the question resolves very little, if anything. As described in the recitation of the facts above, there are several material factual disputes between BellSouth and the intervenors over whether the NXXs in question are "virtual NXXs," whether inequities of compensation will occur if this practice continues, whether mobile carriers will be required to interconnect with all local companies in a LATA to serve the exchanges in their territory and at what cost, and whether local and toll charges will be accurately assessed. ...

Some of CenturyTel's CLBC interconnect agreements recognize the distinction between rating point and routing point. I note this clause from the agreement between CenturyTel of the Midwest-Kendall and Bayland Communications Inc. in Wisconsin [emphasis added]:

Bayland will also designate a Routing Point for each assigned NXX code. Bayland may designate one location within each Rate Center as a Routing Point for the NPA-NXX associated with that Rate Center; alternatively Bayland may designate a single location within one Rate Center to serve as the Routing Point for all the NPA-NXXs associated with that Rate Center and with one or more other Rate Centers served by Bayland within an existing CenturyTel exchange area and LATA.

This agreement clearly recognizes the acceptability to CenturyTel of a centralized routing point.

Q. Has CenturyTel itself signed contracts allowing it to provide FX-like service in other ILECs' territories?

A. In fact, at least one of CenturyTel's corporate affiliates seems to agree with us, and has permission to provide such a service in a different ILEC's territory. I note the following paragraph from the Interconnect Agreement between SBC's Ameritech-Wisconsin and CenturyTel Solutions LLC. The latter appears to be CenturyTel's own CLEC affiliate.

3.1 For SBC-13STATE territory, neither Party shall be prohibited from designating different rating and routing points for the delivery of telephone calls for purposes of providing customers a local presence within a foreign exchange.

See <http://www.psc.state.fl.us/agendas/02080604.html>, initial paragraph of "Case Background".

In such cases, calls shall be rated in reference to the rate center of the assigned NXX prefix of the calling and called parties' numbers. For applicable reciprocal compensation charges associated with the termination of FX traffic refer to Appendix Reciprocal Compensation.

ASAP Paging is not requesting reciprocal compensation from CenturyTel for any calls.

The same agreement has an interesting definition of FX service. In addition to what it calls "line haul" FX, in which the service is physically hauled from a switch in the foreign exchange (e.g., a Lockhart number hauled, for a leased-line fee, to a customer in Austin), it offers an alternative:

2.2.3 Alternatively, under a "dedicated prefix" arrangement, the customer's ordinary access line is assigned a prefix within its serving wire center which is dedicated to functioning as a prefix in a foreign exchange. The serving wire center routes the customer's traffic over dedicated or switched facilities to a switch or switches in the foreign exchange whereby it is connected to telephone numbers in the foreign exchange.

That sounds like a very good explanation of how so-called Virtual NXX service works. Thus, even if ASAP's service were Virtual NXX, which we do not believe to be an accurate description, we see ample precedent within CenturyTel to consider it to be a valid instance of Foreign Exchange service, with multiple rating points sharing a routing point and even a single switch.

Clearly the issues are not as simple as CenturyTel would have us believe. Indeed these issues are presently before the FCC and the industry is heavily divided over the issue. While Mr. Robinson and I each have our opinions, the FCC will ultimately decide the issue, since it has primary jurisdiction over numbering. CenturyTel should not distract the Texas Commission from the key issue before them, the need to for CenturyTel to recognize ELC for calls made to carriers other than ILBCs.

Q. Are the Guidelines determinative in determining how central office codes may be issued?

A. The Guidelines that Robinson cites are published by an industry committee, the ATIS Industry Numbering Committee. As such they are merely, as the title implies, guidelines; they are trumped by FCC Regulations and the Telecom Act itself. The wording of the Guidelines is thus not subject to the same degree of scrutiny as statutory wording; if an interpretation of the Guidelines is at odds with an FCC ruling, then the FCC's ruling would be determinative.

This is important because the FCC has expressly ruled that CMRS providers are entitled to numbering resources and to efficient Type 2 interconnection at the tandem. You cannot have efficient Type 2 interconnection without local numbers in those rate centers where your customers need local calling.

Q. Does it appear that CenturyTel would be satisfied if the location of the POI were local to San Marcos?

A. Mr. Navarette states (at 9), "we now believe that CenturyTel is not obligated to treat calls dialed to 512/384 as ILCS calls." His position appears not to recognize the industry norm that rating and routing are two different concepts, and that the physical location of ASAP's switch in Austin impacts routing but should not impact rating. He implies that CenturyTel has an entitlement to toll or Switched Access revenue based on what ASAP, or other carriers, do on their own side of the POI. This is not about cost recovery, then; it is either about an imaginary pot of Switched Access revenue, or about keeping all competition out of San Marcos.

Q. Has the FCC made any ruling of its own on Virtual NXX?

A. Yes. In a Memorandum Opinion and Order issued July 17, 2002, citing Cox-Virginia and AT&T against Verizon in CC Docket 00-218, the FCC held:

301. We agree with the petitioners that Verizon has offered no viable alternative to the current system, under which carriers rate calls by composing the originating and terminating NPA-NXX codes. We therefore accept the petitioners' proposed language and reject Verizon's language that would rate calls according to their geographical end points. Verizon concedes that NPA-NXX rating is the established compensation mechanism not only for itself, but industry-wide. The parties all agree that rating calls by their geographical starting and ending points raises billing and technical issues that have no concrete, workable solutions at this time.

302. Verizon proposed, late in this proceeding, that the petitioners should conduct a traffic study to develop a factor to account for the virtual FX traffic that appears to be "local" traffic. However, Verizon's contract fails to lay out such a mechanism in any detail. Most importantly, Verizon concedes that currently there is no way to determine the physical end points of a communication, and offers no specific contract proposal to make that determination.

303. Additionally, we note that state commissions, through their numbering authority, can correct abuses of NPA-NXX allocations. As discussed earlier, the Maine Commission found that a competitive LEC there was receiving NPA-NXXs for legacy rate centers throughout the state of Maine although it served no customers in most of those rate centers. To the extent that Verizon sees equivalent

1 abuses in Virginia, it can petition the Virginia Commission to review a
2 competitive LEC's NPA-NXX allocations.
3 [FCC DA 02-1731 Memorandum Opinion and Order, CC Dockets 00-218, 00-249 and 00-251;
4 notes omitted]

5
6 This is notable for several reasons. For one, it specifically makes NPA-NXX assignment
7 more determinative than the end user's geographical location. The FCC also correctly notes the
8 limited scope of the *Brooks* decision in Maine, which CenturyTel proffers as a model for the
9 indictment of Virtual NXX. Brooks offered no services in the exchange areas for which it had
10 been issued NXX codes. In contrast, ASAP Paging has actual paging coverage within the local
11 calling areas in question.

12 Q. What is the difference between "toll facilities" and other "facilities"?

13 A. Mr. Navarrette states (at 14) that "[t]he only facilities we have that will carry those calls
14 to Austin from San Marcos are toll facilities." Indeed he recites (at 15) a list of types of toll calls
15 that go through the tandem, and notes that CMRS carrier traffic may use the tandem under an
16 agreement. But the distinction between "toll" and "local" is one of pricing, not one of
17 transmission engineering. A fiber optic cable, or for that matter any other type of physical
18 facility, does not distinguish between calls based on rate. While the facilities between San
19 Marcos and Greenwood may be primarily used for toll calling, they are certainly capable of
20 carrying other calls as well.

21 Mr. Robinson admitted (deposition at 157-158) that there is no difference in cost between
22 a toll or ELCS trunk, if they have the same meet point. Mr. Navarrette admitted (deposition at
23 26, 27) that the meet point with SWBT for both toll and ELCS facilities is the same SWBT-
24 owned lmt, located within CenturyTel's exchange area roughly two miles from their central
25 office. So in practice, CenturyTel is never handing any calls out of its exchange area; it is
26 handing off calls, whether local or toll, to SWBT at the same meet point.

27 Robinson also states (at 16), in response to a question about ISDN connectivity, that
28 "[s]ince the route from San Marcos to Austin is a toll route, the customer would have to locate an
29 interexchange carrier that has interexchange ISDN capability to meet such a request." Again,
30 this implies that the call is a toll call, when it should be rated as local. If it were handed off to an
31 IXC, then it probably would be a toll call. A call is only handed to an IXC if it is properly rated
32 as toll.

1 Q. If ISDN connectivity were to be provided, would every trunk have to be configured for
2 ISDN, as Mr. Navarrette states (at 17)?

3 A. No. ISDN calls contain a Bearer Capability information element in the SETUP message
4 that initiates them. If the Bearer Capability is 3.1 KHz Audio or Speech, then the call goes over
5 ordinary voice trunks. If the Bearer Capability is 64000 kbit/second unrestricted digital data,
6 then the call can only be routed over a clear-channel facility. Carriers often provision a small
7 trunk group, based on traffic requirements, for such data calls. Routing of ISDN-originated calls
8 is typically based on Directory Number and Bearer Capability, so data calls can easily be routed
9 separately from voice calls to the same destination.

10 Q. Does ISDN normally require special arrangements to be made in order to call between
11 exchanges?

12 A. No. Mr. Navarrette states (at 18), "Special arrangements would have to be made to
13 establish an ISDN service between exchanges." But this implies that CenturyTel's ISDN is not
14 properly configured in the first place, because ISDN calls are simply a form of PSTN call, and
15 should not require prior arrangement.

16 Q. Do calls terminate at a switch?

17 A. No; they are switched there, en route to the termination. That's why it's called a switch.
18 This should be obvious, but Mr. Navarrette seems to be confusing these issues when he answers
19 (at 15) about where calls terminate by saying that they are "routed to ASAP's Austin switch". In
20 the case of ISP-bound calls, the nature of the word "terminate" is, alas, muddled by the FCC's
21 declaration that an ISP's modem bank is also an intermediate point in a call. But this shouldn't
22 matter; CenturyTel should route calls to the designated POI and rate them on the designated rate
23 center.

24 Q. CenturyTel claims to be a "rural" telephone company and therefore exempt from certain
25 obligations under § 251(c) of the Act. Does this seem appropriate?

26 A. No. CenturyTel of San Marcos is hardly rural, let alone a small company. CenturyTel
27 has a curious corporate structure wherein its different exchanges within a state are incorporated
28 separately, although the same personnel, such as Mr. Navarrette, work for more than one of
29 them. The FCC has already held in the *Local Competition Order* at ¶ 1264 that it is the size of
30 the parent company, not a local subsidiary, that determines whether the rural exemption matters.
31 CenturyTel ILECs in Texas now serve more than 50,000 lines, according to Mr. Navarrette's

1 testimony. CenturyTel had more than 1,795,180 access lines nationwide as of 6/30/02,
2 according to its web site; on that date, they had 49,675 in Texas. One day later (July 1), they
3 added approximately 300,000 additional lines, acquired from Verizon in Alabama. On August
4 31, they acquired an additional 354,000 lines from Verizon in Missouri. Even if CenturyTel
5 does not have less than 2% of the access lines in the USA, it is a major carrier, not some "mom
6 and pop" country balco.

7 Regardless of whether CenturyTel's nationwide percent makes it eligible for "rural"
8 treatment, San Marcos is no typical "rural" market. It is the urban center of its area. While not a
9 large city, the San Marcos central office serves a larger population than most rural central offices
10 and is more typical of a large suburban exchange. As such, its costs are hardly typical of a
11 "rural" company. While I do not have access to CenturyTel's books, I was able to make
12 estimates based on the RCT's Benchmark Cost Proxy Model (B-CPM), version 3.1. This model,
13 while admittedly imperfect and based on data that is several years old, provides approximations
14 of loop and other cost pricing.
15 In the case of San Marcos, B-CPM estimates an average "capped local loop cost" of
16 \$1,036.21 per loop, based on an estimate of 25,311 total working lines served in the
17 total loop investment of \$26,227,409. This is a "forward-looking" number based on one
18 particular methodology and using various data, not actual data, for its inputs, so I will not argue
19 the precision, but this number seems to be a reasonable guess for an exchange of this size.
20 For comparison, B-CPM estimated that in the Dallas area where CenturyTel's (449,445 lines),
21 26,574 lines are served with an average forward-looking loop investment of \$277.48. This
22 seems typical of an urban or built-up suburban area. As an example of a rural exchange,
23 Western, Texas, where CenturyTel's (11,111 lines) has an estimated investment of \$8,291.10
24 for its 621 working lines spread over 133.55 square miles. San Marcos seems to be in the respect
25 quite a bit closer to Dallas than to Delphos, CenturyTel's property that seems little deserving
26 of special "rural" treatment.

2 B-CPM was an attempt to model the B-CPM methodology, a "green field" hypothetical network, using
3 current design techniques. Embedded network costs will differ, but in other cases, higher density urban areas have
4 lower loop costs than rural areas, and loop costs are the largest single portion of an LRIC's plant-based costs.
5 CenturyTel's internal Network Services testified that CenturyTel's San Marcos serves approximately 13,000 access
6 lines at present.

1 Q. Does CenturyTel route toll calls between end office, or local calls through a tandem?
2 A. In my direct testimony, I noted that LRICs may route calls directly or via a tandem, as
3 they choose, based upon network efficiency. However, CenturyTel need not choose to do so,
4 and does not do so in Texas. I note however that CenturyTel of San Marcos is an unusual
5 operation in that it consists of only a single central office. Thus there are no toll routes entirely
6 within their territory.
7 The "routing" distinction between "local" and "toll" is a tariff convention that does not
8 always reflect cost characteristics. I recently testified in a case in a different state, wherein the
9 IIJC operated a single host-remote cluster within the LATV. The host was subdivided by three
10 remotes which were within the local calling area of the host, and by three other remotes which
11 formed a different single local calling area. All six remotes used, as their trunks, host-remote
12 links to the host. Calls between remotes went via the host. There were no routing distinctions
13 made between local and toll calls within the cluster. But there were major routing distinctions
14 calls between the two local calling areas were rated as toll, even though they never even left the
15 switch cluster. This sort of arrangement is actually quite common. Verizon New Hampshire, for
16 example, serves telephone rate centers out of its Keene host and its remotes. Considerable rates
17 centers are local to one another, noncontiguous rate centers are usually toll routes. Thus many of
18 the individual trunks carry a mix of local and toll traffic, with all toll routing to the host but
19 routing to one or another rate center.
20 Q. Based on Mr. Smith's statements, does it appear to really matter to CenturyTel if the
21 routing point and rating point were the same, with the bandwidth of calls to CenturyTel if the
22 San Marcos local calling area?
23 A. No, Mr. Smith makes clear that in her opinion, CenturyTel feels entitled to receive tolls
24 or at least withheld access payments for calls that fail to meet any aspect of a complete, multi-
25 part test. The routing point is one aspect of that test. But in the *Further Responses to ASAP*
26 *Paging's Second RFI* (at 2.30), she notes that even if the called pager has an NPA-NXX that is
27 local to San Marcos and even if the pager is physically located within San Marcos, the call falls

1 CenturyTel's San Marcos end office acts as the host to several remotes. In some respects a host end office
2 acts like a tandem when it comes to traffic between the remotes.

1 the locality but because the paging service is in Austin, and because the coverage area of the
2 paging network extends beyond the local calling area.

3 It is only a coincidence that a "Lockhart" number is answered by a paging
4 customer in Lockhart under the existing network arrangement. Second, ASAP
5 has not arranged for local calling between its "Lockhart" rate center and
6 CenturyTel's San Antonio exchange. As a consequence, there is no agreement to
7 treat a call to a paging customer that may actually be in the Lockhart rate center at
8 the time the call is placed as a local call.

9 I think it is a bit of a stretch that the assignment of a Lockhart number to its own local area
10 is only a "coincidence"; most paging customers, I should think, would want paging numbers
11 local to their own area. As noted elsewhere in this Rebuttal, I also dispute that ASAP's
12 "Lockhart" rate center is distinct from SWBT's Lockhart rate center. A rate center is a
13 geographic entity that was initially defined by the LRIC and is now shared among all carriers.

14 And finally, who is ignoring the FCC position that CMRS calls within an MTA should be
15 rated as local. This is reflected in the ASP Rebuttal Order.

16 47. We note that the exchange of traffic between LRICs and commercial
17 mobile radio services (CMRS) providers is subject to a slightly different analysis.
18 In the Local Competition Order, the Commission noted its jurisdiction to regulate
19 LRIC-CMRS interconnection under section 332 of the Act but decided, at its
20 option, to apply sections 251 and 252 to LRIC-CMRS interconnection. At that
21 time, the Commission declined to delineate the precise contours of or the
22 relationship between its jurisdiction over LRIC-CMRS interconnection under
23 sections 251 and 332, but it made clear that it was not rejecting section 332 as an
24 independent basis for jurisdiction. The Commission went on to conclude that
25 CMRS providers, because the latter are telecommunications carriers. The
26 Commission also held that reciprocal compensation, rather than interstate or
27 interstate access charges, applies to LRIC-CMRS traffic that originates and
28 terminates within the same Major Trading Area (MTA). ...

29 Q. Is ISP-bound traffic "telecommunications service"?
30 A. Yes. CenturyTel witness Smith is engaging in a distinguishous denial of the obvious.
31 The FCC bound for an ISP is "telecommunications". Service provided to ISPs is a
32 "telecommunications service". It is also "information access", according to the FCC, but that is
33 not a mutually-exclusive term; rather, it is a special category of telecommunications service
34 which has interstate jurisdictional components. The data going to the ISP is the payload of the

1 telecommunications, at the bottom of the stack is a telephone call. The fact that a phone call is
2 made to an ISP doesn't change the fact that it's a phone call, although it does apparently have
3 some jurisdictional impact.

4 Q. Can information service providers interconnect under Section 251? Does this impact
5 ASAP?

6 A. To begin with, ASAP's Paging is not claiming to be a CLBC and thus is not dependent
7 upon the same rules as CLBCs. But Ms. Smith's statement that "...information service providers

8 may not interconnect under Section 251..." is both literally true and off point. Information
9 service providers *per se*, such as ISPs, do not have rights of interconnection that are normally
10 granted to telecommunications providers. But ASAP is an FCC Licensed CMRS
11 telecommunications carrier which also provides information services. Its customers include
12 among them some information service providers. CenturyTel's customers also include some
13 information service providers. While calls to information service providers are jurisdictionally
14 interstate or at least mixed, and calls to, say, pizza parlors are jurisdictionally interstate, they are
15 both instances of telecommunications service.

16 Q. Do telecommunications carriers have a federally-created legal obligation to interconnect
17 with each other for the delivery of ISP-bound calls?

18 A. Of course they do. Ms. Smith questions this, but if one were to follow Ms. Smith's
19 argument, then there could be no dial-up Internet at all, because LRICs would not need to connect
20 their networks to ISPs! Clearly that was not the FCC's intent, either in its 1988 ASP Exchange,
21 which requires calls to ISPs to be rated as local, or in its more recent rulings. And clearly it was
22 not the intent of the D.C. Circuit court in its May, 2002 ruling in *WorldCom Inc. v. Federal
23 Communications Commission*, which Ms. Smith cites out of context, to shut down local-rated
24 dial-up to ISPs. Ms. Smith's footnote 6 quotes the operative phrase, "Indeed, the Commission
25 does not even point to any pre-Act, federally-created obligation for LRICs to interconnect to each
26 other for ISP-bound calls." She stretches this to infer something that it most certainly does not
27 mean to imply. The *WorldCom* decision questions the FCC's use of Section 251(g) as a
28 rationale for excluding ISP-bound calls from reciprocal compensation. Section 251(g) left intact
29 pre-1996 Access tariffs, so that the flow of Access revenues would not be interrupted pending
30 post-Act FCC action on intercarrier compensation. Now to be sure, the FCC did not point to a
31 pre-Act obligation for LRIC interconnection for ISP-bound traffic. But the FCC most certainly

1 did not deny a post-Act obligation for such interconnection, and the Court did not find that the
2 lack of a pre-Act precedent meant that such interconnection is not required. The context of the
3 sentence she quoted can better be understood from the paragraph surrounding it [emphasis
4 added]:

5 We will assume without deciding that under § 251(g) the Commission might
6 modify LECs' pre-Act "restrictions" or "obligations," pending full implementation
7 of relevant sections of the Act. The Fifth Circuit appeared to make that
8 assumption in *Texas Office of Public Utility Counsel v. FCC*, 265 F.3d 313 (5th
9 Cir. 2001), where it implicitly relied on § 251(g) (by quoting language from an
10 Eighth Circuit case, *Competitive Telecom. Ass'n v. FCC*, 117 F.3d 1068, 1072
11 (8th Cir. 1997)), in sustaining modifications of pre-Act regulations governing the
12 access charges paid to LECs by inter-exchange carriers ("IXCs"). 265 F.3d at
13 324-25. But this assumption is not enough to justify the Commission's action
14 here, as it seems uncontested—and the Commission declared in the Initial Order—
15 that there had been no pre-Act obligation relating to intercarrier compensation for
16 ISP-bound traffic. See Initial Order, 14 FCC Rod at 3695, p. 9; see also *id.* at
17 3690, p. 1, 3707-3710, pp. 28-36. The best the Commission can do on this score is
18 to point to pre-existing LEC obligations to provide interstate access for ISPs. See,
19 e.g., *Revised Order*, 16 FCC Rod at 9164, p. 27; *In the Matter of MTS & WATS*
20 *Market Structure*, 97 F.C.C.2d 682, 711-15, pp. 77-83 (1983). Indeed, the
21 Commission does not even point to any pre-Act, federally created obligation for
22 LECs to interconnect to each other for ISP-bound calls. And even if this hurdle
23 were overcome, there would remain the fact that § 251(g) speaks only of services
24 provided "to interexchange carriers and information service providers"; LECs'
25 services to other LECs, even if en route to an ISP, are not "to" either an IXC or to
26 an ISP."

27
28 Ms. Smith goes on to claim that "the delivery of Internet-bound traffic to an ISP does not
29 constitute a telecommunications service." (Smith at 8) Of course this is wrong: The delivery of
30 the traffic to the ISP is a telecommunications service; what the ISP does with it is not.
31 Information Access, as the FCC defined ISP-bound calling, is merely a form of
32 telecommunications service. To be sure, its specific legal status is still being determined by the
33 FCC and courts because of the pending further remand but the court did not rule that
34 telecommunications is not telecommunications just because one end of the call is to an ISP's
35 number! Since this entire thread of logic is based on a false premise, Ms. Smith's other
36 conclusions that are drawn from it are also null and void.

37 Q. Does Ms. Smith mis-state ASAP Paging's coverage area?

1 A. Apparently she does; she states (at 10), "ASAP has not shown that any of these pages are
2 received within the local calling scope of CenturyTel of San Marcos." I merely point out that
3 Mr. Gactjen of ASAP Paging has addressed this, stating clearly that ASAP's paging coverage
4 does indeed cover the San Marcos local calling area; indeed it has customers in San Marcos and
5 surrounding communities. Because of this detail alone, it would be inappropriate to describe
6 ASAP's NXX codes as "virtual".

7 Q. Are all landline telecommunications services "subject to both state rate and entry
8 regulation and interconnection requirements", as Ms. Smith states (at 12)?

9 A. Not necessarily; many services are under interstate jurisdiction. The key state-
10 jurisdictional question here is whether or not CenturyTel can charge tolls to its own subscribers
11 for calls to ASAP Paging numbers whose NPA-NXX codes are assigned to rate centers that are
12 defined in CenturyTel's tariff as local. CMRS is not the only federally-licensed
13 telecommunications. I note that before the Telecommunications Act required all states to permit
14 landline competition, the FCC authorized Competitive Access Providers (CAPs) to operate,
15 based on the interstate jurisdiction of their landline calls. CAPs as such in Texas were required to
16 register with the PUC, but were not regulated as LECs. While ASAP Paging is not engaging in
17 "exchange access service" and is not a CAP, it is engaging in federally regulated wireless service
18 and, incidentally, "information access." The information access service is interstate although
19 individual calls from basic users are "rated" as local. This is the result of the "ISP Exemption."
20 This is not unique. Bad users are allowed to call a "local" number to reach IXCs or other
21 switched access customers if the access customer purchases either switched access Feature
22 Group A or Feature Group B.

23 Q. Is the *TSR Wireless Order* cited by Ms. Smith (at 11) justification for requiring ASAP to
24 either enter into a wide-area calling plan or have its customers pay toll, as Ms. Smith implies?

25 A. Both *TSR* and the similar *Mountain* orders deal with networks that have substantial
26 differences from ASAP's, and in any case arrive at a rather different conclusion than implied by
27 Ms. Smith. In both cases, the paging companies in question, *TSR* and *Mountain*, utilized Type 1
28 interconnection into ILEC switches, and used dedicated transport facilities to haul these circuits
29 into their single point of interconnection. Type 1 interconnection is, in a technical sense,
30 fundamentally the same as a Direct Inward Dialing circuit such as might be delivered into a
31 PBX. The circuits interconnecting them with the paging terminal are technically equivalent to

1 traditional Foreign Exchange service, essentially a leased line between the user port on a switch
2 and the user's location. The Commission held in both cases that if the CMRS carriers wanted to
3 use this arrangement, they would have to compensate the ILEC for the cost of this bandwidth.

4 We agree with Qwest that, pursuant to the TSR Wireless Order, if Mountain
5 wants to avoid having callers to its customers pay such charges to access
6 Mountain's network, it may enter into a wide area calling arrangement with
7 Qwest. Mountain has effectively entered into such an arrangement with Qwest by
8 requesting dedicated toll facilities to transport calls made to DID numbers
9 provided to Mountain's customers, free of charge to Qwest's customers.
10 Mountain at 13.

11 These cases stand for the proposition that when an ILEC customer dials an NXX that is
12 not "local" to the ILEC customer, then the ILEC can assess long distance charges. The paging
13 company has the opportunity to negotiate with the ILEC if it is interested in "buying down" the
14 end user's "otherwise applicable" toll charges. In our case, however, calls between San Marcos
15 and Lockhart, Pentress or Kyle are local (in other words not "otherwise toll") to San Marcos, so
16 a buy down is simply not necessary.

17 If the paging company chooses to design its network so that the ILEC has to haul traffic
18 outside of its local calling area over dedicated trunks, then the ILEC can charge the paging
19 company for the dedicated transport. In our case, CenturyTel is not hauling traffic outside of its
20 local calling area, or even San Marcos. Remember also that the Mountain case involved
21 dedicated trunk (T1) charges. CenturyTel is not attempting to charge ASAP for dedicated
22 trunks. Instead, it wants to assess per minute of use charges on either the end user or ASAP.

23 I submit: the end users are dialing numbers that are "local" and CenturyTel is not
24 transporting outside of San Marcos. CenturyTel is misquoting the TSR and Mountain decisions.
25 While those cases provide guidance on some points, they simply do support the proposition
26 asserted by CenturyTel since the facts, the costs and the rating are completely different.

27 The Type 1 plus dedicated-transport arrangement used by Mountain and TSR differs
28 markedly from the Type 2 arrangement used by ASAP. With Type 2 interconnection, ASAP
29 actually owns its own switch, so it interconnects to the network as a peer, not like a PBX. There
30 is no interchange transport facility dedicated to ASAP; rather, it simply attaches to the tandem
31 with the same type of Type 2A interconnection used by most cellular providers. This has a very
32 different cost structure from Mountain or TSR. ASAP's calls from CenturyTel are carried, along
33

1 with other carriers' calls, on SWBT's high-bandwidth common (not dedicated) facilities to a
2 large tandem switch which is subtended by many other central offices in the Austin LATA.

3 Q. If San Marcos Internet can receive calls on a toll-free basis in San Marcos from Kyle,
4 Pentress and Lockhart, using CenturyTel's local exchange service, why would it use an ASAP
5 "Lockhart" number?

6 A. Ms. Smith speculates (at 14) that "the only purpose is to utilize ASAP's CMRS
7 advantages to get free transport for these calls to its internet backbone in Austin". While I have
8 had no personal contact with San Marcos Internet and can only offer up my own speculations, I
9 note some other possible advantages. For one thing, CenturyTel's PRI service is unusually
10 expensive, on the order of \$1,500/month per PRI, roughly four times the price charged by ASAP
11 and about twice SWBT's typical price. Price competition is always something that a monopolist
12 wishes not to see. ASAP also provides a number aggregation service, by which calls to any of its
13 numbers, local or foreign exchange, go to the same modem pool. This helps save on modems.
14 (While this is one of the features of Virtual NXX, ILECs also sometimes offer to aggregate local
15 and foreign exchange service on the same ISDN PRI circuit under the name "call by call service
16 selection".) The actual backbone link cost savings, while non-zero, are relatively small, because
17 an access ISP's backbone bandwidth is a fraction of its PRI incoming bandwidth. A typical
18 dialup ISP, assuming no other traffic, needs roughly ten times as many DS-1 circuits for its
19 incoming PRIs as it does for its outgoing backbone link.

20 Q. Ms. Smith notes (at 15) that "Among ILECs in Texas, ELCS requires each ILEC to
21 furnish its own facilities to an agreed upon meet point. What ASAP seeks here is that
22 CenturyTel provide the traffic to it at its switch." Is this correct?

23 A. Not really - CenturyTel hands off the ASAP-bound calls to SWBT at a meet point in San
24 Marcos, and SWBT hauls the traffic to its own tandem and then to ASAP's switch. I do not
25 believe that SWBT is charging CenturyTel for this transit. In any case, I note that she said
26 "[a]mong ILECs". ASAP is not an ILEC. Unlike ILECs, it does not have bulk outside plant
27 crossing a franchised territory, and it does not have the traffic density typical of ILECs.

28 Q. How do carriers normally interconnect with one another for the provision of local
29 services? How was it done in the past, and how has the public network architecture changed?

30 A. This matters because the model of interconnection that CenturyTel seems to favor is out
31 of date by some decades. The telephonic map is divided into exchange areas, each

corresponding to a rate center. Outside of metropolitan areas, more often than not, rate centers have corresponded to the location of central office buildings (wire centers), most of which were established in the late 19th and early 20th centuries. Major cities, such as Austin, often have more than one wire center within a rate center. Sometimes a single wire center will be shared by more than one rate center. But in the San Marcos area, it appears that wire centers and rate centers have a 1:1 correspondence.

Telephone companies laid out their wire centers based on the economics of the day.

Local loops always terminated at a wire center, so more wire centers meant shorter loops, but more switches, trunks and real estate. Switches were, until the 1960s, entirely electromechanical; the last electromechanical switches were only removed from the network within the past few years. Interface trunk facilities were also rather expensive; it was only the coming of fiber optics in the 1980s that reduced the incremental cost of bandwidth by orders of magnitude. Toll calls required operator intervention or special automated tollcalling equipment (Automatic Message Accounting); it was not economical to put "Local" ALMA in most small wire centers, so toll tollcalling was done at regional Toll Switches, using Centralized ALMA. There was thus a discrete toll network. Extended Local Calling - local calls between exchanges - used dedicated trunks which did not need ALMA; sometimes the trunks were built by concatenating loop pairs at the junction of the two exchanges. That would have been the logical way, for example, to connect San Marcos to Lockhart, had LEC been established in, say, 1960.

CenturyTel's current claims make some sense if one imagines that the network looks like it did a few decades ago, where "long distance" was expensive to produce and incremental mileage was a high-cost effort. But of course it doesn't. The network has evolved dramatically, such that the regulatory and business models do not accurately map to the engineering model. One important change is the existence of host and remote switches. While all pre-1970s switching systems were essentially self-contained, the digital switches that began to be deployed in the late 1970s facilitated a new level of the network hierarchy. The common control and trunk interfaces are part of the host, which typically although not always contains the largest number of time interfaces as well. Smaller central offices are set up as remotes, which typically have limited processing capability of their own and most often do not contain trunk interfaces. (Some remotes, like the Lucent 5RSSM, are theoretically capable of terminating interoffice trunks Others, like the Nortel RLCM, are not.) The links from the host to the remote are vendor-

popularity. The Bell companies and other large LECs have used remotes to replace the old "community dial office" (CDO) and other types of small electromechanical switch. So while a wire center with, say, 1,000 subscribers might have had a CDO with its own toll trunks and perhaps LEC trunks, today it is usually provided as a remote of a larger switch, which could be fifty miles or further away. So intercarrier connections are normally routed via the host, whatever that might be.

Host-remotes switching causes many LEC routes to be longer than before, in terms of actual transmission mileage, but this is not really a problem, because fiber optics have completely changed the economics of bandwidth provisioning. Again, in the networks of a few decades ago, transmission paths were often short and direct. Every type of trunk center facility required repeaters at some regular spacing, such as the six thousand foot repeater spacing in the once-popular T1 carrier, the oldest type of digital transmission facility. Nowadays, however, the main cost is in bringing fiber to the wire center. Once it's there, incremental bandwidth costs very little, because a single fiber optic system (typically two strands of fiber in service with two in standby) can carry huge amounts of bandwidth, such as the popular OC-48 (2.488 Gbps, which, if configured only for telephony, could carry 32,256 simultaneous calls). Repeaters are rarely needed. So fiber optic links aren't necessarily routed via the most direct path; rather, an optimal fiber optic network is one that touches all of the wire centers in a region with minimal total mileage. Common practice is to use SONET rings, which provide redundant routes into each site on the ring.

Another innovation is the Digital Loop Carrier (DLC). This is a field-mounted multiplexer which terminates subscriber lines. The DLC allows local loops to be shorter. A Telecordia guideline called Carrier Service Area (CSA) suggests that local loops should not be longer than 12,000 feet, and that a local distribution network of DLCs should be used instead. This is the basis of the "green field" design used in the FCC's bandwidth plan as the Hybrid Cost Proxy Model (HCPM). Mr. Neversette states that CenturyTel uses this technology within San Marcos. When a DLC is used in conjunction with a host-remote cluster, it is often more desirable to attach the DLC to the host, not the nearest remote. Not all remotes are capable of connecting to DLCs in the efficient "integrated" manner. Both the DLC and the remote exist for the purpose of creating local line terminations. A remote is generally larger than a DLC, though today's

1 larger DLCs are larger than many remotes. So in such cases, the wire center itself becomes
 2 irrelevant, except as a kind of large DLC serving subscribers within a 12,000 foot radius.
 3 Forward-looking network architecture, outside of metropolitan areas, thus consists of large
 4 regional host switches supporting an array of remote terminals, classified either as remote
 5 switches or DLCs based primarily on size, linked by SONET rings.

6 Another major evolution concerns the interoffice switching network. Before the AT&T
 7 divestiture, AT&T maintained a network of Toll Offices, while metropolitan areas had local
 8 tandems. The Bell Operating Companies, as well as some independents, typically operated
 9 "Class 4" toll offices, while AT&T Long Lines operated Class 3, 2 and 1 backbone switches.
 10 After divestiture, LATAs were organized, and each LATA had at least one, and sometimes
 11 several, switches designated as Access Tandems. These provided places for interexchange
 12 carriers to exchange traffic with the LECs. Most of them are also capable of switching local
 13 traffic as well, although a large amount of local traffic flows on Direct End Office Trunks. With
 14 the easing of local competition, CLECs as well as CMRS providers have been allowed to
 15 interconnect at tandems, although Direct End Office Trunks (in the CMRS context referred to as
 16 Type 2B) are considered a desirable supplement when traffic is high enough to justify their use.

17 With this modern network architecture, existing local vs. toll distinctions, at least within a
 18 LATA, are preserved only as a matter of price. They do not reflect actual carrier costs. Their
 19 main purpose is to generate revenue which is used to hold down monthly local service rates; i.e.,
 20 a cross-subsidy. Thus when CMRS carriers interconnect at a tandem, they are not creating high
 21 costs that must be recovered via tolls. In fact, they are interconnecting in a manner that is most
 22 efficient to all the affected parties from a network perspective. The real question is whether, and
 23 if so, how much can an ILEC bill either the user of the CMRS carrier?

24 Q. How does a CMRS network compare to the host/remote arrangement you described?

25 A. The two are quite similar, because both recognize that a single switching entity covers a
 26 larger geographic area than a wire center. Thus the routing point - the host or a more centralized
 27 POI - serves multiple rating points. CMRS switches typically cover an even larger area than a
 28 host or even a tandem, but in either case the precedent is well established that the rating point
 29 can be and quite often is different from the routing point.

30 Q. How are NPA-NXX (prefix) codes established in a central office switch?

1 A. Prefix codes are loaded into the memory of central office switches. For outgoing calls,
 2 switches have tables in memory which associate each area code or prefix with a destination
 3 route, or a list of routes that is tried in order (first and final routing). These tables also determine
 4 whether or not, for instance, it is necessary to dial 1 before a call, or if it is necessary to dial 7 or 10
 5 digits. Thus it is only a matter of typing a few "translations" into the switch and the route that a
 6 call takes can change.

7 For incoming calls, numbers can be assigned quite flexibly. With number portability, a
 8 single switch can service numbers from many prefix codes; an NPA-NXX code that is marked as
 9 "portable" no longer definitively identifies the destination switch, merely the rate center. CLECs
 10 pick up customers this way; their switches almost always cover a larger geographic area than an
 11 ILEC switch, so it's common for CLEC-served lines to be served out of a switch in a different
 12 rate center. CMRS providers like ASAP, on the other hand, do not currently participate in
 13 number portability; thus the NPA-NXX of a CMRS carrier's switch identifies the switch as well
 14 as which rate center the call should be rated to for purposes of retail and wholesale
 15 compensation.

16 In an ILEC host-remote cluster, the same rule applies; any number within the range
 17 served by the host can appear on any port of the switch or remote. Mr. Navarrete testified in
 18 deposition CenturyTel does this in San Marcos for its users so they do not have to change
 19 numbers if they move within San Marcos: "CenturyTel chose to not inconvenience the customer
 20 by changing their number every time you moved across town." (Navarrete deposition at 56)
 21 While ILECs typically assign numbers based on geography, a foreign exchange circuit to a
 22 different rate center served by the same host-remote cluster can be implemented merely by
 23 changing the translation for the "closed" end to have a prefix code in the desired "open end" rate
 24 center NPA-NXX block. This is not "Virtual NXX" as typically defined for the simple reason
 25 that an ILEC has actual subscribers in the foreign exchange. But then ASAP also has real paging
 26 subscribers physically in the San Marcos local calling area. Virtual NXX in the strict sense was
 27 apparently invented after CLECs installed regional host switches with multiple prefix codes to
 28 serve customers in multiple rate centers, and who then set the foreign exchange service and call-
 29 by-call service selection prices at or near a level commensurate with cost, namely, zero. Some
 30 other CLECs, focused on the ISP business, merely specialized further in the FX aspect of the

business, without their own local subscribers in the non-local rate centers for which they had prefix codes.

None of this is a crime punishable by imposition of a toll. It serves the public interest because it allows for competition and therefore innovative pricing that makes telecommunications services and Internet access more affordable to users. It certainly does not cost CenturyTel anything more or different, since CenturyTel's cost is exactly the same if it sends any given call to a SWBT or Verizon user, an ASAP Kyle, Fentress or Lockhart user "who carries a pager" or an ASAP ISP customer.

CenturyTel's complaint is about "lost toll" to which it simply is not entitled. If ASAP did not exist and these calls went to a customer of SWBT or Verizon, the call would not be toll and the cost would be the same. CenturyTel's revenue would be the same. CenturyTel is both revenue and cost indifferent to whether these calls go to ASAP or SWBT or Verizon, or any other terminating carrier.

For this reason, Mr. Robinson's assertion that ASAP will create pressure for CenturyTel to raise its ELCS surcharge is simply wrong. While it is true that higher traffic volume could theoretically raise the ELCS "revenue requirement" that is the case regardless of the identity of the carrier that terminates the traffic.⁵ CenturyTel's problem is not the identity of the ELCS co-carrier; its problem is that these ELCS calls are made. CenturyTel wants to keep the traffic within its San Marcos network, between CenturyTel customers. It does not want any truck with co-carriers.

I anticipate that CenturyTel will make much of the "physical location" of the ISPs and argue that they are not "in" Kyle, Fentress or Lockhart. To the extent this matters or is true, there are good reasons for this and society benefits from the result. Dial-up calling is only cost-effective for the customer if the cost of the call is not time sensitive. So if there were no "local" ISP numbers, users would be deprived of the benefits of affordable Internet access that the vast majority of Americans enjoy. So the relevant question becomes one of methodology. How can an ISP establish a local presence? What can a telecom company do to facilitate this?

⁵ CenturyTel's ELCS "per access line" revenue requirement was based on approximately 6,000 fewer access lines than CenturyTel presently serves. It could be that CenturyTel's ELCS surcharge is too high.

Dial-in modem facilities today must be provided using digital interfaces into digital central office switches. That is a requirement of the now-standard V.90 modem protocol; server-side modems with analog interfaces are limited to 33.6 kbps, while digital interfaces can go up to 53 kbps. In addition, as a practical matter, only digital interfaces of DS1 or larger make any sense for an ISP. These go into a Remote Access Server (RAS), which integrates the modem and access-router functions. While small (one-PRI) RAS systems exist, it is generally more economical and easier to manage larger ones; current high end systems, such as the Nortel Networks CVX-1800, can support 2,688 modems in a single cabinet that fits into a quarter of a standard rack. It is unrealistic for an ISP to rent closets belted dragsters in small towns in order to put a dozen analog modems with "local" phone numbers, when a Virtual NXX or FX service allows modern high-performance RAS equipment to be installed in a proper ISP server environment.

In a typical Internet Access Service Provider ("ISP") environment, the data bandwidth to the retail ISP data center is roughly 1/10 to 1/15 of the ISDN PRI or channelized T1 PSTN bandwidth going in to the RAS, because the average modem uses only 4,000-6,000 bps during a session. An ISP Point-of-Presence might thus have a T1 of data bandwidth going back to the ISP for every 200-350 modems. And a typical ISP will provision one modem for every 8-15 subscribers, depending on average usage. So a PoP needs to have, say, 1,600 to 5,000 dial-up subscribers just to make efficient use of the first T1 of Internet bandwidth. An ISP will typically, however, provision at least two T1 circuits, for redundancy, or use a high-bandwidth data transport service such as ATM (which is generally not available, at least at reasonable cost, in rural areas). This sets the parameters for what could realistically be considered a minimum-sized Access ISP. ISPs typically operate this type of setup in rural areas, using either CLEC FX-like or ILBC FX service to aggregate sufficient territory.

Some local calling areas are too small to sustain a physically local ISP on this basis. The Kyle area appears to have (based on FCC estimates) about 2,500 telephone lines. Fentress has about 400; Lockhart about 7,000. Should an ISP be expected to rent real estate in Kyle, Fentress and Lockhart simply to provide "local" service when, at no additional cost to CenturyTel, the ISP could collocate at a regional PoP, such as Austin? There are significant additional costs involved in ISPs establishing a local presence in every rate center where they have customers. This cost must be passed on to customers, or the ISP will simply not offer service in rural areas.